

a high reflection film substantially perpendicular to the semiconductor multi-layer film; and

a low reflection film substantially perpendicular to the semiconductor multi-layer film, wherein the low reflection film comprises  $\text{Al}_2\text{O}_3$  having a stoichiometric ratio composition.

19. (New) The semiconductor laser device according to Claim 1, wherein said resistivity of said  $\text{Al}_2\text{O}_3$  film being in an inclusive range of  $1 \times 10^{12}$  through  $1 \times 10^{14} \Omega\cdot\text{m}$ .

#### REMARKS

Favorable reconsideration of this application in light of the above amendment and following discussion is respectfully requested. The Applicants wish to thank Examiner Jackson and Supervisory Patent Examiner Ip for granting and conducting an interview with the Applicants' representatives.

Claims 1-19 are presently pending in this application. Claims 18 and 19 are newly added, and Claims 2 and 17 have been amended by way of the present amendment. Claims 1-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hashimoto et al. (U.S. Patent No. 6,067,310), in view of Iwamoto et al (U.S. Patent No. 5,744,533), and further in view of Howng (U.S. Patent No. 4,647,895).

Regarding the rejection of claims 1-8 and 17 under 35 U.S.C. § 103(a), the Applicants respectfully request reconsideration. These claims all recite a semiconductor laser device comprising a low reflection film and a high reflection film. The low reflection film contains a film comprised of at least  $\text{Al}_2\text{O}_3$  having a resistivity of  $1 \times 10^{12} \Omega\cdot\text{m}$  or more.

It was the present Applicants who identified through experimentation that the resistivity of  $1 \times 10^{12} \Omega\cdot\text{m}$  or more has an excellent heat dissipation property which can have

a profound impact on the reliable operation of the device. (See e.g., specification, page 12, line 12, continuing to page 13, line 24, as well as Figure 5). It was through the Applicants' experimentation that identified this range of resistivity values that gave rise to the Applicants' solution to the source of the problem regarding reliability for laser devices.

The present invention advances the semiconductor laser device art, not only because of the device structure taught in the application, but because the Applicants identified the source of the problem. Importantly, United States patent law recognizes the identification of the source of a problem and the remedy for that problem as patentable subject matter. For example, the court in In re Sponnoble, 160 USPQ 237, 243 (C.C.P.A. 1969) made this point clear:

It should not be necessary for this court to point out that a patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the "subject matter as a whole" which should always be considered in determining the obviousness of an invention under 35 U.S.C. §103.

The Applicants' identification of this particular range of resistivity, and its relationship to reliable operation of a semiconductor laser device, is objective evidence that must be considered in view of the fact that it was the Applicants, through experimentation, identified a relationship between this resistivity value and the reliable operation of the device, as discussed in the specification.

In contrast, Hashimoto et al, is directed to a semiconductor laser, that merely provides background features, with regard to state-of-the-art devices prior to the present invention. Hashimoto et al, as recognized in the outstanding Office Action, does not teach the resistivity value that is specifically recited in Claim 1 and is not believed to teach anything that negates the patentability of the present invention. Furthermore, it presents no objective evidence that the prior art even contemplates the association of Al<sub>2</sub>O<sub>3</sub> resistivity and device reliability.

Iwamoto et al mentions the specific resistivity value but does so with regard to "an adhesive composition for bonding a semiconductor device" (see e.g., title) and is not directed to a semiconductor laser device. Moreover, the use of a filler having this particular resistivity, in no way teaches or suggests the use of its combination in a semiconductor laser device as is the case with the present invention.

The outstanding Office Action, nevertheless, asserts that the motivation for making the combination would have that it "provided enhanced thermostability over the pure form of the conductive polymers. Therefore, combining both reference [sic] would have been obvious to obtain the invention as specified" (Office Action, page 3, paragraph 6). However, the Court of Appeals for the Federal Circuit, has made eminently clear, such as the recent case of In re Lee, 61 USPQ 2d 1430, 1434 (Fed. Cir. 2002), makes clear that an examiner's conclusory statement unsupported by evidence does not adequately address the issue of motivation to combine. "This factual question of motivation is material to patentability, and cannot be resolved on subjective belief and unknown authority" (Id.). Citing a former decision in Brown and Williams Tobacco v. Phillip Morris Inc., 229 F.3d 1120, 1124-25, 56 USPQ2d 1456, the Court explained that "the factual inquiry whether to combine references must be thorough and searching Id. it must be based on objective evidence of record. This precedent has been reinforced in a myriad of decisions and cannot be dispensed with".

It is precisely this which Applicants in the present invention respectfully note is absent in the present rejection. There is no objective evidence of record that provides any teaching or suggestion to include the particular claimed resistivity in the specific structure cited. Rather, it was only the Applicants, based on their experimental findings, who were able to make this remarkable discovery, and greatly improve the reliability of such devices. Neither Hashimoto et al nor Iwamoto et al teach or suggest this combination and one of

ordinary skill in the laser device art reviewing these references could not have been lead to combine these references to arrive at the present invention, unless it was a result of improper hindsight reasoning. Consequently, it is respectfully submitted the invention defined by Claims 1-8 and 17 patentably defines over the asserted prior art.

Turning to the rejection of Claims 9-17, it is noted that independent Claim 9 is directed to a semiconductor laser device, which contains specific features, including a low reflection film that contains a film comprised of  $\text{Al}_2\text{O}_3$  having a stoichiometric ratio composition. Once again, the present Applicants recognize the importance of the stoichiometric ratio as a way to avoid oxidation of surfaces and corresponding device failures (see e.g., specification, page 12, lines 1-4).

The outstanding Office Action recognizes that Hashimoto et al fails to teach the  $\text{Al}_2\text{O}_3$  stoichiometric ratio composition. However, the Office Action attempts to cure this deficiency by asserting Howng as being "analogous art". The alleged motivation to combine the references was to "reduce the cost of the sensor and to enhance the sensitivity, medium temperature range and electrical resistive ceramic sensor". Applicants respectfully traverse this conclusory statement for motivation to combine references.

Howng does disclose at column 2, lines 13-22, that the resistivity varies on a logarithmic basis relative to changes of temperature depending on the stoichiometric ratio of the elements in the composition. However, there is no logical relationship of this observation in Howng to the structure in Hashimoto et al so as to arrive at the presently-claimed invention. Rather, once again, it was the present Applicants who discovered the source of the problem and resolved the problem as reflected in the present Claim 9 as well as dependent claims thereon.

As discussed above, it is respectfully submitted that the present Office Action has not met its burden of providing a proper 35 U.S.C. §103 rejection, because there is no objective evidence supporting why such a combination would be obvious. It is the burden of the U.S.P.T.O. to explain with objective evidence why an applicant's invention is "obvious" and it is respectfully submitted that the present Office Action has failed to do this. Consequently, it is respectfully submitted that no matter how Hashimoto et al is combined with Howng, the combination fails to teach or suggest the invention defined by Claims 9-17. Therefore, it is respectfully submitted that the invention defined by Claims 9-17 also patentably define over the asserted prior art.

Regarding newly added claim 18, the Applicants respectfully solicit an indication of allowability. The Applicants respectfully submit that the recitations of this claim are not disclosed by the cited prior art references, nor for dependent Claim 19. Further, no new matter has been added to this application.

Consequently, in view of the above, it is believed that this application is in condition for allowance, and such a notice is respectfully solicited. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.



Gregory J. Maier  
Attorney of Record  
Registration No. 25,599  
David A. Bilodeau  
Registration No. 42,325



**22850**

Tel No. (703) 413-3000  
Fax #: (703) 413-2220  
GJM:BDL:DHS:sd/kst

I:\atty\DAB\197261US.am.wpd

**Marked-Up Copy**

Serial No: 09/662,704

Amendment Filed on:

May 15, 2002

IN THE CLAIMS

Please amend Claims 2 and 17 as follows:

--2. (Amended) The semiconductor laser device according to claim [1] 19, wherein said low reflection film is formed from a single layer.

17. (Amended) The semiconductor laser device according to any one of claims 1 to 16, wherein said  $\text{Al}_2\text{O}_3$  film is deposited by an electron cyclotron resonance plasma sputtering process[, an electron beam evaporation process, or an electron beam sputtering process].--

Claims 18 and 19 have been newly added.